ing the caissons the area to be occupied by them was partially piled, and the heads cut off below the water, at the proper level of the river bed: these piles were more for insuring an even bearing for the caisson, than to take any burden, and the result has sufficiently proved this to be the case. This method of founding by caissons was a great advance over the old one, by "starlings," as those huge bulwarks of timber filled with loose stones were called; and Rochester-bridge is the only example of such rude work remaining in England.

In 1811 Mr. Rennie commenced Waterloo-bridge, and introduced coffer-dams, by which the area of the foundations could be laid bare, and the river bed rendered, by close piling, sufficiently solid to support the superimposed mass, *for a great depth beneath the bed*, which is the important feature that has enabled this and the other bridges with similar foundations to remain unaffected by the scouring away of the bed around them.

The stability of a pier founded on a caisson grating depends upon the area exposed to the pressure remaining undisturbed. The gratings at Westminster were laid about 5 feet below the bed of the river, and so long as the scour affected only the bed *above* the level of the grating, the bridge stood secure; but the scour through the arch which has yielded, and is now, with its immediate neighbours, supported upon centreing, has undermined the gratings beneath its piers, which have consequently canted inwards, and allowed the arch to spread.

The case is precisely the same with Blackfriars. Piers supported upon an efficiently piled area have their foundations, not upon the *heads* of the piles, but upon the *ends*, which most probably will be 20 feet below the bed of the river: the area supporting the pier is therefore 20 feet thick. This system of piling is protected by sheet piling, encasing it like a box, which preserves all the inner parts; and a disturbance by scour may take place to a considerable depth below the mere masonry of the pier, without evil consequences resulting. This denudation is not, of course, a desirable thing, but the amount that would be fatal to a pier founded on a caisson grating without piles would be harmless to one founded as those of Waterloo and Southwark bridges are.

These, then, Sir, are the facts of the case, and I think sufficiently answer the question, why have Westminster and Blackfriars bridges given away, while Waterloo and Southwark remain firm?

S. C.

FOREIGN ARCHITECTURAL AND ARTISTICAL INTELLIGENCE.

Emolument and Honour conferred on Science and Art Men.—M. Leverrier, who (contemporaneously with Mr. Adams) discovered the *existence* of the planet Neptune by mathematical calculation, has been named a member of the senate of the French Republic.—The King of Prussia has conferred the decoration of the Order of Merit (a sort of Legion of Honour) on Professor Owen, the English comparative anatomist; M. Gaillard, the painter, of Brussels; and M. Tenerani, the sculptor at Rome. The same monarch has forwarded to the French painter, M. Ingres, a large gold medal, for having presented the king with a copy of the engravings lately published of M. Ingres's pictures.—M. Baumgärtner, formerly the editor of a physico-mathematical journal, has been appointed Minister of Finance and Public Works by the Emperor of Austria.

Berlin.—The electro-telegraphic lines for connecting the different police-stations of the Prussian capital with those of the fire brigade, have now been completed. By these means any accident of the kind becomes instantaneously known to the firemen, and although the expense has been, at first, considerable, the amount will be saved in property and premiums of the insurance offices. Accidents of any kind, robberies of some magnitude, &c., will become similarly known to the police authorities, for which purpose a small apparatus has been put up in the *bureau* of the chief of the Berlin police.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

THIS society held its first meeting after the Christmas recess, on Wednesday evening, January 28th. A considerable number of valuable works were presented to the association from various learned societies and private individuals. A Roman urn was exhibited by Mr. Tucker, and a singularly rowelled spur of the 15th century, by Mr. Cavanagh, of Wexford, Ireland. Mr. Burkett sent a drawing of the remains of the ecclesiastic lately discovered in the Crypt of St. Stephen's chapel, Westminster, and a most interesting discussion took place on the subject. A letter from Mr. Duesbury correcting some serious errors in the hitherto published accounts of the crypt was read, and that gentleman, who was present, added to the information contained in his letter, some important as well as interesting facts respecting the original construction and appearance of that beautiful building. Mr Carrington exhibited several very careful rubbings of brasses in Wantage and Langbourne churches, Berks, and St. Michael's, Penkeril (near Falmouth), Cornwall. Mr. Colnaghi exhibited some beautiful specimens of tapestry, one of them decorated with imitation jewellery. Mr. Planché read a paper on the Monuments of the Cockayne family, in Ashburne church, Derbyshire; and it was announced from the chair that the next congress would be held at Newark, under the presidency of his Grace the Duke of Newcastle.

GAS.

Ely.—The gas inspectors of Ely Trinity have been superseded by the local Board of Health, who have now taken charge of the lighting of the town.

Southampton.—The local Board of Health here also are taking an active part in the extension of gas lighting. They have reduced the long-standing debt of the town to the local gas company by 2,000*l.*, and the company have since announced a reduction of price to 5*s.* a thousand cubic feet, from Michaelmas last.

Newport.—The town has been planted with ornamental gas lamps, and the new gas company have lit the High-street.

Cambridge.—An active canvass is now in progress through this city for subscribers to the proposed new gas company. The price is to be 4*s.* a thousand cubic feet, and the list of subscribers guaranteeing that they will patronise the new company is already a large one, according to the *Cambridge Chronicle*.

Bilston.—At the annual meeting of the Bilston Gas Company a dividend at the rate of 8 per cent. on the paid-up capital was lately announced, with a surplus of 53*l.* added to the reserve fund. The sum total of profit on this small concern was only 1,253*l.* odd.

Preston.—The result of previous reduction in the price of gas here has been such that the directors, in their annual report, announce that they "feel justified in again reducing the price, so that on all bills made out after the 1st of March next, the net cash price will be 4*s.* 6*d.* per thousand to the small consumers, and 3*s.* 9*d.* to the largest." It was resolved at the annual meeting, "That a dividend of 1*l.* per share, net, out of the profits of the half-year ending 31st December, 1851, be now declared, payable by the treasurer on the 2nd February next;" and, "That the salaries of the auditors be increased 30*l.* each per annum."

London.—"Unlike some gas companies," says the *Journal of Gas Lighting* "the Chartered has repudiated the system of maintaining their accustomed dividends, in the face of the late reduction of price, by resorting to the supply of an inferior article; and, as it is now the only free and unfettered gas company in the city of London, they are on the eve of profiting largely by the position they have in this respect assumed. Let us hope that the same wise policy will be pursued under the presidency of the new governor, Benjamin Hawes, Esq." It is by increased purity alone, and hence by extension in private dwellings, not by defilement or adulteration, that the dividends are to be increased, and they will be so, on these conditions, to an extent that may astonish the shareholders as well as the management.—The Imperial Gaslight and Coke Company have given notice that the price of their gas, by meter, will be reduced to 4*s.* 6*d.* per 1,000 cubic feet, dating from 1st January instant, and that the charge, by scale, for the 15-hole Argand burner, to burn from sunset to 9 o'clock, six days in the week, will be at the rate of 2*l.* 2*s.* per annum; and other burners in proportion.

Prismatic Refractors for Burners.—Mr. Boggett has recently patented an application of optical science to gas-lights, whereby they are said to be greatly increased in brilliancy, without additional expenditure of gas. It consists simply in placing a long prismatic lens on each side of an Argand burner, by which the appearance of three perfect flames of equal power is produced. These lenses may be applied to any description of burner, but the patentee of course prefers his own burner, with lateral jet-holes, patented in 1850, and now known as "the smokeless burner."

Books.

General Board of Health: Minutes of information *collected on the practical Application of Sewer Water and Town Manures to Agricultural Production. Ordered to be printed for the Use of Local Boards of Health and their Surveyors, &c., December*, 1851. Her Majesty's Stationery Office. 1852.

To the satisfactory solution of the difficult, and as yet unsettled question of the disposal of the refuse and sewage of towns with the least offence and injury, and the most advantage, to the community at large, there are two essential aspects of the subject which must necessarily be well considered, namely, as it relates to the sanitary state of towns, and even of agricultural districts, and as it relates to the cultivation and improvement of the soil in the latter districts, and especially in those more immediately surrounding towns. The paper under notice, together with its appendices, constitutes a valuable and interesting contribution of the most recent and approved experience and suggestion as to both of these vital questions. The minutes are drawn up by Mr. Henry Austin, the secretary to the General Board of Health, and amongst the appendices are other valuable reports and papers, tables, and suggestions on various points bearing on the general question.

Stated broadly, the result now arrived at appears to be that on the whole, and notwithstanding the errors of the Metropolitan Sewage Manure Company, a distribution of liquid manure through tubular mains and branch pipes to adjoining horticultural and agricultural districts, with hydrants and hose-pipes in the fields, would be the best way of disposing of the sewage of towns; but that where, or when, such a system could not be continuously in operation, the sewage might be solidified on Prince Albert's principle of upward filtration, through tanks with false bottoms, as in the filtration of Thames water for town use, and with whatever filtering medium, such as charcoal, gypsum, burnt clay, &c., as suggested by the Prince, or otherwise, may be selected as best adapted to the circumstances. This principle of filtration, as we have before remarked, and as appears to have been considered in the original suggestion, is equally applicable to the separation of liquid manure itself in a fit state for distribution to fields, a filtering medium simply separating the solid refuse being substituted for one absorbing the valuable materials in solution.

The pamphlet not only contains matter of vital import as relates to towns and their suburban districts, but also to farmers and agriculturists in general, every farmyard supplying to the rural farm what every town does to its own surrounding market gardens; so that whether by mere gravitation or by steam or hydraulic power, every farm might be organised with an *arterial* watering and manuring system as well as with a rewous

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